

Design Note



From: DEMI R & D Dept.

DN#: 011

Date: August 15, 2002

Re: Interfacing Transverters to low current "Push to Talk" circuits of some modern Transceivers.

PREFACE

It is always recommended to "Hard Key" any transverter that is interface with a transceiver. This will enable a positive transmit keying and prevent relay bounce or hang-up with simple or complex microwave systems. Most of the newer transceivers introduced by all of the major manufactures include an accessory connector that includes a connection for any external device that needs to be keyed by the transceivers push to talk circuit. Sometimes the signal that is supplied is a positive voltage or an output of a "Open Collector" device that may sink or source a signal to ground. What ever the circuitry is, it will have a specified current limitation. This limitation should be followed if you wish to avoid unnecessary and costly repairs to your transceiver.

PROBLEM:

Most transverter and transverter designs incorporate both keying signal types, PTT-H and PTT-L. H being a positive voltage and L being a grounded signal. Most H circuits require low current sources of under 10 mA. If used this way, be sure to review the specifications of the transceiver used. Some transceivers will only source a few mA. Most PTT-L keying circuits in transverters connect low current relay coils to ground to key the transverter. These relays may only require 20-30 mA of sink current but for some of the newer transceivers on the market, 20 mA may be over it's limit. Review the specifications of the transceiver used.

SOLUTION for PTT-H:

Simple modifications to the keying circuits in the transverter can be done to accommodate the lower "sink and source" current problems. If you need to source less current in the keying circuit (PTT-H) try the following shown in Figure 1. The PTT-H circuits require a voltage to drive a base of a NPN transistor. If the base of this transistor has only a series resistor, a proper modification will be to increase the value and include a divider resistor. Depending on the voltage supplied by the output of the transceiver and the sink current specification, you can calculate the resistor value required by the PTT-H circuit with Ohms law. Divide the supplied voltage by the desired sink current. Use approximately 50 % less than the maximum specified sink current. This resistor value should then be divided in half and rounded up to the nearest standard resistor value. The NPN switching transistor will function correctly if the voltage on the base of the transistor is above 1.5 volts. So, if the 2 resistors are the same value, the base voltage will be half of the supplied voltage. If using a DEMI transverter, increase the value of R1 and R2 on the TC board to lower the sink current. If they are 1K in value, and the source voltage is 8 volts, it will sink 4 mA.

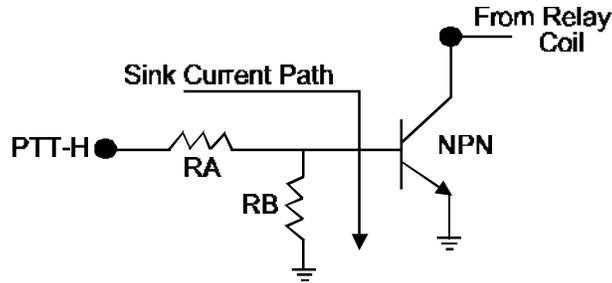


FIGURE 1.

SOLUTION for PTT-L:

This solution may not be as simple. It may need some testing and measuring before implementing. It will require adding a PNP transistor and a resistor along with modifying the circuit. This transistor will operate as an “inverter” It translates your transceiver’s PTT-L output signal into a PTT-H input signal that will key a transverter. The reason for the testing is that all open collector circuits in transceivers will be different depending on the manufacture. The type of PNP transistor will also have an effect on the determination of the series resistor required. Install the transistor of choice with a selected resistor as shown in Figure 2. Determine how much current is required to key the transverter by grounding the resistor. Measure the voltage drop across the resistor and use Ohms law to determine the sink current required or install a current meter between the resistor and ground. Increase the resistor value if less sink current is required. If installing this in a DEMI transverter, some circuit modification will be required. You may want to remove D2 from the TC board since it is not required for this type of switching. The vacant pad marked PTT-L is a good place to install the series resistor that connects to the base of the PNP transistor. The collector can be connected to the PTT-H connection and the emitter lead can be attached to any of the “ON” circuitry on the TC preferably by the D4 connection. See the TC schematic.

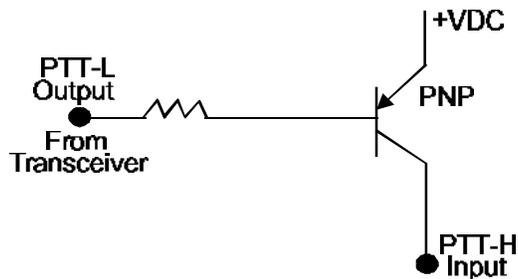


FIGURE 2.

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